What is Claimed is:

1. A method for generating orthogonal spread codes in a mobile communication system comprising the steps of:

generating a first square matrix having a size of powers of 2 by operating an initial matrix 2×2;

generating a second square matrix of same size of the first square matrix by operating the first square matrix;

composing a third square matrix of double size of the first square matrix by arranging the first square matrix as a second quarter matrix and a third quarter matrix of the third square matrix, arranging the second square matrix as a first quarter matrix of the third square matrix, and arranging the second square matrix as a fourth quarter matrix of the third square matrix by multiplying all elements thereof with -1;

making a deformed matrix by inserting a zero vector between a column or a row of the third square matrix ; and

generating orthogonal spread codes for channel discrimination from the rows or columns of the deformed matrix.

2. The method according to claim 1,

wherein the first quarter matrix is arranged in the upper right of the third square matrix, the second quarter matrix is arranged in the upper left of the third square matrix, the third quarter matrix is arranged in the lower left of the third square matrix, and the fourth quarter matrix is arranged in the lower right of the third square matrix.

3. The method according to claim 2,

wherein said step of making a deformed matrix includes the step of inserting a certain column of zero vector in front or the rear of each of quarter matrices of the third square matrix; and

the generating of orthogonal spread codes is done by taking each of the rows of the deformed matrix as each of the orthogonal spread codes.

4. The method according to claim 2,

wherein said step of making a deformed matrix includes the step of inserting a certain row of zero vector over or under each of the quarter matrices of the third square matrix; and

the generating of orthogonal spread codes is done by taking each of the columns of the deformed matrix as each of the orthogonal spread codes.

5. The method according to claim 1, wherein the 2×2 initial matrix is $\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}$.

6. The method according to claim 5, wherein the first row of the initial matrix is arranged in the left and the second row thereof is arranged in the right to generate the first row of the first 4×4 square matrix.

7. The method according to claim 6, wherein the first row of the initial matrix is arranged in the left and the second row is applied with the opposite symbol and arranged in the right to generate the second row of the first 4×4 square matrix.

8. The method according to claim 6, wherein the first row of the initial matrix is arranged in the right and the second row thereof is arranged in the left to generate the third row of the first 4×4 square matrix.

9. The method according to claim 6, wherein the first row of the initial matrix is applied with the opposite symbol and arranged in the right and the second row thereof is arranged in the left to generate the fourth row of the first 4×4 square matrix.

10. The method according to claim 1, wherein the second square matrix is generated by circular shifting the rows in the first square matrix as half of the matrix size.

11. A method for generating orthogonal spread codes in a mobile

communication system comprising the steps of :

operating an initial square matrix having a size of powers of 2 to generate a first square matrix two times larger than the initial square matrix;

operating the first square matrix to generate a second square matrix;

arranging the first square matrix as a second quarter matrix and a third quarter matrix, arranging the second square matrix as a first quarter matrix, and arranging the second square matrix as a fourth quarter matrix by multiplying all elements thereof with -1 to generate a third square matrix;

inserting a zero vector certain row or column of the third square matrix to compose a deformed matrix; and

generating orthogonal spread codes for channel discrimination from the rows or columns of the composed matrix.

12. The method according to claim 11, wherein the first quarter matrix is arranged in the upper right of the third square matrix, the second quarter matrix is arranged in the upper left of the third square matrix, the third quarter matrix is arranged in the lower left of the third square matrix, and the fourth quarter matrix is arranged in the lower right of the third square matrix.

13. The method according to claim 12, wherein said step of composing a deformed matrix includes the step of inserting a certain column of zero vector in front or the rear of each of quarter matrices of the third square matrix in; and

wherein said step of generating an orthogonal spread code includes the step of taking each of the rows of the composed matrix as each of the orthogonal spread codes.

14. The method according to claim 12, wherein said step of composing a deformed matrix includes the step of inserting a certain row of zero vector over or under each of the quarter matrices of the third square matrix to compose the deformed matrix; and

wherein said step of generating orthogonal spread codes includes the step of taking each of the columns of the composed matrix as each of the orthogonal spread

codes.

15. The method according to claim 11, wherein the initial square matrix having the size of powers of 2 uses a quarter matrix of the third square matrix in the previous step having a size that is half of the third square matrix to be obtained.

16. The method according to claim 15, wherein the first row of the initial matrix is arranged in the left and the second row thereof is arranged in the right to generate the first row of the first square matrix two times larger than the initial square matrix.

17. The method according to claim 16, wherein the first row of the initial matrix is arranged in the left and the second row is multiplied with -1 and arranged in the right to generate the second row of the first square matrix two times larger than the initial square matrix.

18. The method according to claim 16, wherein the first row of the initial matrix is arranged in the right and the second row thereof is arranged in the left to generate the third row of the first square matrix two times larger than the initial square matrix.

19. The method according to claim 16, wherein the first row of the initial matrix is multiplied with -1 and arranged in the right and the second row thereof is arranged in the left to generate the fourth row of the first square matrix two times larger than the initial square matrix.

20. The method according to claim 19, further comprising the step of arranging the odd rows and the even rows of the initial square matrix as first and second rows to generate four rows of the first square matrix.

21. The method according to claim 11, wherein the second square matrix is

generated by recursively shifting the rows in the first square matrix as half of the matrix size.

22. A method for generating orthogonal spread codes in a mobile communication system comprising steps of :

operating an 2×2 initial matrix to generate a first square matrix having a size of powers of 2;

arranging the first square matrix as a second quarter matrix and a third quarter matrix;

operating the first square matrix to generate a second square matrix;

arranging the second square matrix as a first quarter matrix and applying a minus symbol to all elements of the second square matrix to generate a fourth quarter matrix;

composing a third square matrix by taking the first to fourth quarter matrices as quarter matrices of the third square matrix;

inserting zero column vectors among certain columns of the third square matrix to compose a target matrix; and

taking rows of the target matrix to generate orthogonal spread codes for channel discrimination.

09925460 . 071201